

What is claimed:

1. A method for spotting words in a speech signal, the method comprising the steps of:

generating a first recognition score based on the speech signal and a lexicon entry for a first word, the first recognition score tracking an absolute likelihood that the first word is in the speech signal;

estimating a first background score based on the first recognition score; and

calculating a first confidence score based on a matching ratio between a first minimum recognition value and the first background score, the first confidence score tracking a noise-corrected likelihood that the first word is in the speech signal.

2. The method of claim 1 further including the step of averaging the first recognition score over a predetermined period of time.

3. The method of claim 1 further including the steps of:

dividing the first minimum recognition value by an average value for the first recognition score over a predetermined period of time such that the matching ratio results, the average value defining the first background score; and

normalizing the matching ratio;

said normalized matching ratio defining the first confidence score.

4. The method of claim 3 further including the step of locating a minimum value within the first recognition score.

5. The method of claim 4 further including the step of searching a predetermined range of the first recognition score for the minimum value such that local minimums are excluded from the matching ratio calculation.

6. The method of claim 1 further including the step of comparing the first confidence score to a predetermined confidence threshold, the first word being in the speech signal when the first confidence score exceeds the predetermined confidence threshold.

7. The method of claim 6 further including the step of spotting a second word in the speech signal.

8. The method of claim 7 further including the steps of:
generating a second recognition score based on the speech signal and a lexicon entry for a second word, the second recognition score tracking an absolute likelihood that the second word is in the speech signal;

estimating a second background score based on the second recognition score;
and

calculating a second confidence score based on a matching ratio between a second minimum recognition value and the second background score, the second confidence score tracking a noise-corrected likelihood that the second word is in the speech signal.

9. The method of claim 8 further including the step of comparing the second confidence score to the predetermined confidence threshold, the second word being in the speech signal when the second confidence score exceeds the predetermined confidence threshold.

10. The method of claim 9 further including the steps of:

determining whether the first word and the second word correspond to a common time period within the speech signal; and

selecting between the first word and the second word based on the first confidence score and the second confidence score when the first word and the second word correspond to the common time period.

11. The method of claim 1 further including the step of calculating the confidence score on a frame-by-frame basis.

12. A method for calculating a word spotting confidence score for a given word, the method comprising the steps of:

dividing a minimum value of a speech recognition score by an average value of the speech recognition score over a predetermined period of time such that a matching ratio results, the average value defining an estimated background score; and

normalizing the matching ratio;

said normalized matching ratio defining the confidence score.

13. The method of claim 12 further including the step of locating the minimum value within the speech recognition score.

14. The method of claim 13 further including the step of searching a predetermined range of the recognition score for the minimum value such that local minimums are excluded from the matching ratio calculation.

~~15.~~ A word spotting system comprising:

a speech recognizer for generating recognition scores based on a speech signal and lexicon entries for a plurality of words, the recognition scores tracking absolute likelihoods that the words are in the speech signal; and

a spotting module for estimating background scores based on the recognition scores;

said spotting module calculating confidence scores on a frame-by-frame basis based on matching ratios between minimum recognition values and the background scores, the confidence scores tracking noise-corrected likelihoods that the words are in the speech signal.

16. The word spotting system of claim 15 wherein the spotting module includes:

a confidence module for dividing the minimum recognition values by average values for the recognition scores such that the matching ratios result, the average values defining the background scores;

said confidence module normalizing the matching ratios such that the normalized matching ratios define the confidence scores.